

### REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1, 4-11, 14 and 16-19 will be pending in the application subsequent to entry of this Amendment.

#### Discussion of the Claim Amendments

The amendments to claims 1 and 7 are intended simply to define the invention more precisely and rearranging the wording of claim 7.

New claims 16 and 17 are supported by the description in the specification, for example, in Example 2, as well as by Fig. 2.

New claims 18 and 19 are supported by the description in the first paragraph of page 5 in the specification.

The new and amended claims find ample basis in the description and do not introduce added subject matter. Favorable consideration is requested.

#### Evidence Provided by Mr. Yokoo's Declaration Filed August 16, 2006

Items 1 and 9 of the Official Action discuss in some detail the examiner's view on the evidence provided in Mr. Yokoo's declaration filed August 16, 2006, pointing out various alleged deficiencies in the evidence submitted as well as making assumptions of properties inherent in the disclosure of the Chen et al reference. In particular, on page 5, item 9, second paragraph, it is assumed that the Chen et al reference "inherently possessed a turbidity of at least 2000 NTU absent any clear evidence to the contrary". Applicants wish to directly address this observation and explain by logic alone why this conclusion is erroneous.

One specific point made is that the Chen reference did not use "pulp-reduced" mango juice. Applicants submit that even though Mr. Yokoo used "pulp reduced" mango juice which was not used by Chen et al, as the examiner states, the declaration of Mr. Yokoo is suitably representative of the Chen et al disclosure and sufficiently exhibits differences between the mango juice of the present invention and the juice of Chen et al.

As relevant background information, applicants must emphasize the fact that in the production of the fruit juice of Chen et al, the key factor which determines the clarity and turbidity of the juice is the UF membrane and not whether pulp reduction is conducted before the filtration. This is apparent from the fact that the UF membrane used in Chen et al has a pore size which is small enough to retain pectin, other suspended solids and microbes, with a

preferred molecular weight cutoff being in the range of  $5 \times 10^4$  to  $1 \times 10^5$  (see column 7, last line -column 8, line 4 of Chen et al). Thus, the UF membrane will block passage therethrough of any insoluble suspended solids as well as even soluble molecules having a molecular weight over 100,000, regardless of whether the fruit juice to be membrane filtered is pulp-reduced.

Keeping this background knowledge in mind, attention is directed to Fig. 1 provided in the declaration of Yokoo. The "Pulp-reduced" mango juice which falls under claim 1 of the present application, is shown to have a turbidity of 2,685, and a visual (photographic) appearance which is definitely not clear. In distinct contrast, the same juice becomes clear such that the turbidity is as low as 6.97 after filtration through a UF membrane (molecular cutoff  $5 \times 10^4$ ). Since, the molecular cutoff limit of the UF membrane used by Yokoo is in the range preferred by Chen et al -- and hence determines a clarity of filtrates -- the clarified mango juice ("UF(50,000)" in the declaration) appropriately represents the product of Chen et al, at least in terms of clarity or turbidity.

Further, applicants submit that Chen et al mainly relate to orange and grape fruit juices which contain a relatively small amount of insoluble components. In contrast, mango juice containing a greater amount of insoluble components would have clogged a UF membrane if filtration had been conducted without any previous reduction of pulp components. Based on their own personal experience, applicants consider that Chen et al also must have conducted a pre-treatment of some kind to prevent clogging in the case of attempting to produce a clarified juice from mango. Accordingly, the declaration by Mr. Yokoo adequately and appropriately compares and exhibits the difference in turbidities between the mango juice of the present invention and the juice of Chen et al.

For the above reasons it will be apparent that the evidence already of record in this application is more than ample to demonstrate both the novelty and inventiveness of the subject matter defined by the pending claims. Reconsideration is requested.

#### Response to Prior Art-Based Rejections

Claims 1 and 4-9 stand rejected as allegedly being anticipated by the Chen et al patent US 5,756,141. Applicants disagree with this conclusion for at least the reasons presented above as well as the evidence already of record and for the comments that follow.

First let us discuss the present invention. The applicants have found there are characteristic properties of mango juice with respect to pulp particles, which are not shared by other fruit juices. Please refer to Example 1 and Fig. 1 of the present application, where applicants treated fruit juices of various plants to reduce their pulp components by centrifugal separation. As a result, it was found that mango juice, even after centrifugation, had an unexpectedly high turbidity of about 7,300 NTU, in contrast to other fruit juices in which substantial reductions in turbidity were observed following use of the same treatment. The thus-treated mango juice also retained an excellent fruit flavor.

In addition, further studies by the applicants are described in Example 2, the results being summarized in Fig. 2. The distribution curve of mango juice pulp particles in Fig. 2 reveals sharply separable peaks, that is peaks including particles of over 10  $\mu\text{m}$  and those including particles of 10  $\mu\text{m}$  or smaller.

Based on these characteristic properties of mango juice pulp particles, the applicants have provided the processed mango juice of the present invention, wherein the larger pulp particles have been selectively excluded from mango juice by a readily carried out method of centrifugation. Therefore, it is important to note that in accordance with the present invention, while the pulp content is reduced, it is not totally removed. Such reduction in pulp particles is effected so that the mango juice has a pulp content which is no greater than 20 vol% but that is sufficient to provide the mango juice with a turbidity above 2,000 NTU (the values are to be calculated after restoration to the sugar content of the mango fruit juice in the squeezed state).

Since the pulp particles included in the mango juice of the present invention are in colloidal form, the formation of a precipitate which will take place upon storage in the case of regular fruit juices can be avoided. Moreover, this avoidance of precipitation is achieved without sacrificing the flavor of the fruit juice. Furthermore, the translucent appearance of the mango juice of the present invention (*see* the photographic images in the declaration of Yokoo) is preferable in various applications, such as in producing beverages having a fruit flavor.

Next, let us discuss the disclosure of Chen et al. The essential feature of the present invention, that is, the employment of mango in producing the characteristic fruit juice, is not described or even remotely suggested in Chen et al. Chen et al do not describe or suggest any

characteristic size distribution of pulp particles in mango juice as discovered and claimed by the applicants. Chen et al also do not describe that by reducing a content of pulp components, particularly those smaller than 10  $\mu\text{m}$ , various problems associated with fruit juices and fruit juice beverages can be eliminated. Further, the selective separation of mango juice pulp particles in accordance with the present invention would not be possible if the UF membrane as used in Chen et al was employed.

Applicants respectfully take issue with many of the comments in the Official Action. The examiner misinterprets Chen et al in various ways. For instance, he states that "Both applicants and Chen et al had the same goal, namely to reduce insoluble solids (such as pulp) while retaining soluble solids (such as color components)". He also states that "the juice of Chen et al inherently has a turbidity above 2000 NTU". Moreover, he states that the specification contains a statement that "The mango juice depulping method is not particularly restricted, and centrifugal separation, filtration, membrane separation or the like may be employed", indicating that the present invention is identical to that of Chen et al since membrane separation may be employed. Not one of these statements is well founded.

The goals between Chen et al and the present invention are quite different. Chen et al aims at removing essentially all insoluble solids from a fruit juice by use of a UF membrane having a molecular cutoff limit as stated above. Chen et al describes (column 8, second paragraph) that "the clarified juice contains soluble solids, primarily sugars, minerals, acids, vitamins, soluble color substances and water", indicating that all ingredients in the juice exist in a liquid (solubilized) state. Therefore, the goal of Chen et al differs from that of the present invention which is aimed at **including**, as opposed to Chen's removing, certain sized pulp particles in order to maintain a flavor of mango juice.

Secondly, the examiner's misconception that the juice of Chen et al inherently has a turbidity above 2000 NTU appears to be a consequence of his misunderstanding that soluble color components are factors which make a fruit juice turbid. However, as explained above and shown by the declaration of Yokoo, color components which pass through the UF membrane have little effect on turbidity. In fact, the declaration of Yokoo visually as well as quantitatively shows that the mango juice clarified by the UF membrane is far clearer than the standard solution with the turbidity of 200 NTU, which is ten times clearer than 2,000 NTU.

Therefore, it is not remotely possible that the product of Chen et al could have a turbidity over 2,000 NTU.

Thirdly, a person skilled in the art can readily understand that the "membrane separation" recited in the specification does not necessarily include UF membrane separation. It will also be noted that a separation method recited in the claims is limited to centrifugation.

For the above reasons it is respectfully submitted that claims 1 and 4-9 define inventive subject matter. Reconsideration and allowance are solicited.

Claims 10, 11 and 14 have attracted three separate rejections all of which are based on Chen et al as the primary reference. Having demonstrated why the Chen et al reference is not pertinent to the other claims, claims 10, 11 and 14 are also regarded as defining patentable subject matter for the above reasons and also by virtue of their dependency directly or indirectly from an allowable claim.

Reconsideration and favorable action are solicited. Should the examiner require further information, please contact the undersigned.

Respectfully submitted,

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